IT-Information Technology – Call for Papers

Special Issue: Challenges in Space IT

Scope of the Journal
IT - Information Technology is a strictly peer-reviewed scientific journal. It is the oldest German journal in the field of information technology. Today, the major aim of IT - Information Technology is highlighting issues on ongoing newsworthy areas in information technology and informatics and their application. It aims at presenting the topics with a holistic view. It addresses scientists, graduate students, and experts in industrial research and development.

Aim of the Special Issue
While the majority of terrestrial IT systems have changed radically over the last decades, the technologies in the space sector have remained unchanged for a long time. Once being the major driving force for the technical evolution of IT systems, nowadays space technologies have the reputation to be completely outdated technology-wise in comparison to earth-bound systems. Recently however, space actors – management and engineers – fundamentally change their perspective: driven by the rapidly emerging NewSpace sector, private industrial players and their plans for implementing large satellite constellations are demanding appropriate technologies which are at the same time performant, reliable and cheap. As these three characteristics have so far been mutually exclusive in the space sector, there is a paradigm shift in sight: highly specialized, radiation hardened and expensive space hardware is replaced by commercial high-performance electronics that have proven their extreme reliability by undergoing various radiation testing campaigns and also by flight heritage, e.g. in the CubeSat domain. At the same time artificial intelligence (AI) technologies like deep learning (DL) algorithms have evolved tremendously in terms of energy-awareness, mainly driven-by and targeting on-device usage scenarios on cellphones and other mobile devices. If we now bring together the progress from both worlds and aggregate it under the term NewSpace-Avionics, completely new application scenarios for future space systems and missions will emerge. Specifically computer science plays a major role in NewSpace-Avionics.

The purpose of this special issue is to collect papers that contribute ideas, methods and case studies that illuminate various aspects and challenges from the perspective of computer science on our path to NewSpace-Avionics. In particular, these include, but are not limited to:

- AI-driven spacecraft autonomy: technologies on-ground and on-board for self-aware space systems
- Intelligent FDIR: state of the art and the way forward
- Avionics for highly autonomous missions: constellations, deep space probes and beyond
- Next-generation on-board data handling systems
- Modular software frameworks for future space systems

Submission: Authors are asked to kindly submit their manuscript online at http://www.editorialmanager.com/itit. The style guide for preparing the manuscript (Word or Latex) is listed there. A step by step guide through the submission process will be provided after registration. Publication language is English. The length of a contribution to the special issue should be at most eight printed pages.

Dates:
- First Submission: 30.09.2020
- First Notification: 30.10.2020
- Second Submission: 31.11.2020
- Second Notification: 31.01.2021
- Camera-ready Version of Papers: 28.02.2021

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